

CLAIMS

What is claimed is:

1. A spreader bar assembly for use with a kite powered conveyance device having a control bar (26, 26'), said spreader bar assembly including a spreader bar (18) adapted for connection to a harness of a user of the kite powered conveyance device; an arm (20, 20') connected to said spreader bar and having a longitudinal axis; a tether connector (42, 42') mounted on said arm (20, 20') and adapted for connection thereto of a tether (38) from the kite powered device to connect the tether (38) to said spreader bar (18); and a hook (22, 22') mounted on said arm and adapted to be hooked to the control bar (26, 26') of the kite powered conveyance device to connect the control bar (26, 26') of the kite powered conveyance device to said spreader bar (18), characterized by said tether connector (42, 42') and said hook (22, 22') being rotatably mounted on said arm (20, 20') for rotation about the longitudinal axis of said arm.

2. A spreader bar assembly as claimed in claim 1, further characterized by said tether connector (42) being formed integrally with said hook (22).

3. A spreader bar assembly as claimed in claim 1, further characterized by said arm (20, 20') being pivotally connected to said spreader bar (18), and by a spring (64) urging said arm (20, 20') to extend from said spreader bar (18).

4. A spreader bar assembly as claimed in claim 1, further characterized by a quick release member (72) enabling release of said arm (20') from said spreader bar (18).

5. A spreader bar assembly as claimed in claim 1, further characterized by said tether connector including a rotor member (42') and a shackle member (66') pivotally attached to said rotor member (42').

6. A spreader bar assembly as claimed in claim 1, further characterized by said hook being a snap hook (22').

7. A control apparatus for a kite powered conveyance device, including a control bar (26, 26') adapted for connection by port and starboard control lines (30, 36) to a kite (12) of the kite powered conveyance device; a tether guide (34, 34') connected to an end of said control bar (26, 26'); a spreader bar (18) adapted for connection to a harness (16) of a user of the kite powered conveyance device; an arm (20, 20') connected to said spreader bar (18) and having a longitudinal axis; a tether connector (42, 42') mounted on said arm (20, 20'); a hook (22, 22') mounted on said arm (20, 20') and adapted to be connected to said control bar (26, 26') to connect said control bar (26, 26') to said spreader bar (18); and a tether (38) having a first end connected to said tether connector (42, 42') and a second end adapted to be connected to one of the port and starboard control lines (30, 36), said tether (38) passing through said tether guide (34, 34'), characterized by said tether

connector (42, 42') and said hook (22, 22') being rotatably mounted on said arm (20, 20') for rotation about the longitudinal axis of said arm (20, 20').

8. A control apparatus for a kite powered conveyance device as claimed in claim 7, further characterized by said tether connector (42) being formed integrally with said hook (22).

9. A control apparatus for a kite powered conveyance device as claimed in claim 7, further characterized by said arm (20, 20') being pivotally connected to said spreader bar (18), and by a spring (64) urging said arm (20, 20') to extend from said spreader bar (18).

10. A control apparatus for a kite powered conveyance device as claimed in claim 7, further characterized by a quick release member (72) enabling release of said arm (20') from said spreader bar (18).

11. A control apparatus for a kite powered conveyance device as claimed in claim 7, further characterized by said tether connector including a rotor member (42') and a shackle member (66') pivotally attached to said rotor member (42').

12. A control apparatus for a kite powered conveyance device as claimed in claim 7, further characterized by said hook being a snap hook (22').

13. A control apparatus for a kite powered conveyance device as claimed in claim 7, further characterized by said tether guide (34, 34') having a slot (44) extending from an end thereof into said tether guide (34, 34'') for passage therethrough of said tether (38), the slot (44) being sized in relationship to said tether (38) to permit said tether guide (34, 34') to grip said tether (38) in the slot (44), while allowing removal of said tether (38) from the slot (44) in response to pulling on said tether (38).

14. A control apparatus for a kite powered conveyance device as claimed in claim 13, further characterized by the slot (44) terminating within said tether guide (34, 34', 34'') in a circular portion (76).

15. A control apparatus for a kite powered conveyance device as claimed in claim 14, further characterized by the circular portion (76) having a diameter greater than the width of the slot (44).

16. A control apparatus for a kite powered conveyance device, including a control bar (26) adapted for connection by port and starboard kite leads (28, 32) and port and starboard kite control lines (30, 30') to a kite (12) of the kite powered conveyance device; a tether guide (34'') adapted for connection to one of the kite leads (28, 32); a spreader bar (18) adapted for connection to a harness (16) of a user of the kite powered conveyance device; an arm (20, 20') connected to said spreader bar (18) and having a longitudinal axis; a tether connector (42, 42') mounted on said arm (20, 20'); a hook (22, 22') mounted on said arm (20, 20') and adapted to be hooked to

said control bar (26) to connect said control bar (26) to said spreader bar (18); and a tether (38) having a first end connected to said tether connector (42, 42') and a second end adapted to be connected to one of the port and starboard control lines (30, 36), said tether (38) passing through said tether guide (34"), characterized by said tether connector (42, 42') and said hook (22, 22') being rotatably mounted on said arm (20, 20') for rotation about the longitudinal axis of said arm (20, 20').

17. A control apparatus for a kite powered conveyance device as claimed in claim 16, further characterized by said tether connector (42) being formed integrally with said hook (22).

18. A control apparatus for a kite powered conveyance device as claimed in claim 16, further characterized by said arm (20, 20') being pivotally connected to said spreader bar (18), and by a spring (64) urging said arm (20, 20') to extend from said spreader bar (18).

19. A control apparatus for a kite powered conveyance device as claimed in claim 16, further characterized by a quick release member (72) enabling release of said arm (20') from said spreader bar (18).

20. A control apparatus for a kite powered conveyance device as claimed in claim 16, further characterized by said tether connector including a rotor member (42') and a shackle member (66') pivotally attached to said rotor member (42').

21. A control apparatus for a kite powered conveyance device as claimed in claim 16, further characterized by said hook being a snap hook (22').

22. A control apparatus for a kite powered conveyance device as claimed in claim 16, further characterized by said tether guide (34'') having a slot (44) extending from an end thereof into said tether guide (34'') for passage therethrough of said tether (38), the slot (44) being sized in relationship to said tether (38) to permit said tether guide (34'') to grip said tether (38) in the slot (44), while allowing removal of said tether (38) from the slot (44) in response to pulling on said tether (38).

23. A control apparatus for a kite powered conveyance device as claimed in claim 22, further characterized by the slot (44) terminating within said tether guide (34'') in a circular portion (76).

24. A control apparatus for a kite powered conveyance device as claimed in claim 23, further characterized by the circular portion (76) having a diameter greater than the width of the slot (44).

25. A kite powered conveyance device, including a kite (12) having port and starboard ends; a control bar (26, 26') having port and starboard ends; port and starboard control lines (30, 36) connecting the port and starboard ends of said control bar (26, 26') to the port and starboard ends,

respectively, of said kite (12); a tether guide (34, 34') connected to one end of said control bar (26, 26'); a harness (16) adapted to be worn by a user of said kite powered conveyance device; a spreader bar (18) connected to said harness (16); an arm (20, 20') connected to said spreader bar (18) and having a longitudinal axis; a tether connector (42, 42') mounted on said arm (20, 20'); a hook (22, 22') mounted on said arm (20, 20') and hooked to said control bar (26, 26') to connect said control bar (26, 26') to said spreader bar (18); and a tether (38) having a first end connected to said tether connector (42, 42') and a second end connected to one of said port and starboard control lines (30, 36), said tether passing through said tether guide (34, 34'), characterized by said tether connector (42, 42') and said hook (22, 22') being rotatably mounted on said arm (20, 20') for rotation about the longitudinal axis of said arm (20, 20').

26. A kite powered conveyance device as claimed in claim 25, further characterized by said tether connector (42) being formed integrally with said hook (22).

27. A kite powered conveyance device as claimed in claim 25, further characterized by said arm (20, 20') being pivotally connected to said spreader bar (18), and by a spring (64) for urging said arm (20, 20') to extend from said spreader bar (18).

28. A kite powered conveyance device as claimed in claim 25, further characterized by a quick release member (72) enabling release of said arm (20, 20') from said spreader bar (18).

29. A kite powered conveyance device as claimed in claim 25, further characterized by said tether connector including a rotor member (42') and a shackle member (66') pivotally attached to said rotor member (42').

30. A kite powered conveyance device as claimed in claim 25, further characterized by said hook being a snap hook (22').

31. A kite powered conveyance device as claimed in claim 25, further characterized by said tether guide (34, 34') having a slot (44) extending from an end thereof into said tether guide (34, 34') for passage therethrough of said tether (38), the slot (44) being sized in relationship to said tether (38) to permit said tether guide (34, 34') to grip said tether (38) in the slot (44), while allowing removal of said tether (38) from the slot (44) in response to pulling on said tether (38).

32. A kite powered conveyance device as claimed in claim 31, further characterized by the slot (44) terminating within said tether guide (34, 34') in a circular portion (76).



33. A kite powered conveyance device as claimed in claim 32, further characterized by the circular portion (76) having a diameter greater than the width of the slot (44).

34. A kite powered conveyance device, including a kite (12) having port and starboard ends; a control bar (26) having port and starboard ends; port and starboard kite leads (28, 32) connected to said port and starboard ends, respectively, of said control bar (26); port and starboard control lines (30, 36) connecting said port and starboard kite leads (28, 32) to the port and starboard ends, respectively, of said kite (12); a tether guide (34") connected to one of said kite leads (28, 32); a harness (16) adapted to be worn by a user of said kite powered conveyance device; a spreader bar (18) connected to said harness (16); an arm (20, 20') connected to said spreader bar (18) and having a longitudinal axis; a tether connector (42, 42') mounted on said arm (20, 20'); a hook (22, 22') mounted on said arm (20, 20') and hooked to said control bar (26) to connect said control bar (26) to said spreader bar (48); and a tether (38) having a first end connected to said tether connector (42, 42') and a second end connected to one of said port and starboard control lines (30, 36), said tether passing through said tether guide (34"), characterized by said tether connector (42, 42') and said hook (22, 22') being rotatably mounted on said arm (20, 20') for rotation about the longitudinal axis of said arm (20, 20').

35. A kite powered conveyance device as claimed in claim 34, further characterized by said tether connector (42) being formed integrally with said hook (22).

36. A kite powered conveyance device as claimed in claim 34, further characterized by said arm (20, 20') being pivotally connected to said spreader bar (18), and by a spring (64) for urging said arm (20, 20') to extend from said spreader bar (18).

37. A kite powered conveyance device as claimed in claim 34, further characterized by a quick release member (72) enabling release of said arm (20') from said spreader bar (18).

38. A kite powered conveyance device as claimed in claim 34, further characterized by said tether connector including a rotor member (42') and a shackle member (66') pivotally attached to said rotor member (42').

39. A kite powered conveyance device as claimed in claim 34, further characterized by said hook being a snap hook (22').

40. A kite powered conveyance device as claimed in claim 34, further characterized by said tether guide (34'') having a slot (44) extending from an end thereof into said tether guide (34'') for passage therethrough of said tether (38), the slot (44) being sized in relationship to said tether (38) to permit said tether guide (34'') to grip said tether (38) in the slot (44), while allowing

removal of said tether (38) from the slot (44) in response to pulling on said tether (38).

41. A kite powered conveyance device as claimed in claim 40, further characterized by the slot (44) terminating within said tether guide (34'') in a circular portion (76).

42. A kite powered conveyance device as claimed in claim 41, further characterized by the circular portion (76) having a diameter greater than the width of the slot (44).

43. A tether guide for use with a control apparatus of a kite powered conveyance device having a kite (12), a control bar (26, 26'), control lines (30, 36) connecting the control bar (26, 26') to the kite (12), and a tether (38) connected to the kite, said tether guide including a body member (34, 34') having a first end adapted for attachment to the control bar (26, 26'), characterized by said body member having a second end with a slot (44) extending from the second end into said body member (34, 34') for passage therethrough of the tether (38), the slot (44) being sized in relationship to the tether (38) to permit said body member (34, 34') to grip the tether (38) in the slot (44), while allowing removal of the tether (38) from the slot (44) in response to pulling on the tether (38).

44. A tether guide as claimed in claim 43, further characterized by the slot (44) terminating within said body member (34, 34') in a circular portion (76).

45. A tether guide as claimed in claim 44, further characterized by the circular portion (76) having a diameter greater than the width of the slot (44).

46. A tether guide as claimed in claim 43, further characterized by an opening (78) passing through said body member (34) for passage therethrough of means for connecting said tether guide to the control bar (26).

47. A tether guide as claimed in claim 43, further characterized by said body member (34') being formed integrally with the control bar (26').

48. A tether guide as claimed in claim 43, further characterized by said body member (34) being made of a soft elastomeric material.

49. A tether guide as claimed in claim 48, further characterized by the material being polyurethane.

50. A tether guide for use with a control apparatus of a kite powered conveyance device having a kite (12), a control bar (26), kite leads (28, 32) connected to the control bar (12); kite control lines (30, 36) connecting the kite leads (28, 32) to the kite (12), and a tether (38), connected to the kite, said

tether guide including a body member (34'') having a first end adapted for attachment to one of the kite leads (28, 32), characterized by said body member (34'') having a second end with a slot (44) extending from the second end into said body member (34'') for passage therethrough of the tether (38), the slot (44) being sized in relationship to the tether (38) to permit said body member (34'') to grip the tether (38) in the slot (44), while allowing removal of the tether (38) from the slot (44) in response to pulling on the tether (38).

51. A tether guide as claimed in claim 50, further characterized by the slot (44) terminating with said body member (34'') in a circular portion (76).

52. A tether guide as claimed in claim 51, characterized by the circular portion (76) having a diameter greater than the width of the slot (44).

53. A tether guide as claimed in claim 50, further characterized by an opening (78) passing through said body member (34'') for passage therethrough of means for connecting said tether guide to one of the kite leads (28, 32).

54. A tether guide as claimed in claim 50, further characterized by said body member (34'') being formed integrally with one of the kite leads (28, 32).

55. A tether guide as claimed in claim 50, further characterized by said body member (34") being made of a soft elastomeric material.

56. A tether guide as claimed in claim 55, further characterized by the material being polyurethane.

57. A control bar for use with a control apparatus of a kite powered conveyance device having a kite (12), kite control lines (30, 36) connecting the kite (12) to said control bar, and a tether (38) connected to the kite, said control bar comprising a bar member (26'), and a tether guide (34') formed integrally with said bar member (26'), characterized by said tether guide having a slot (44) therein for passage therethrough of the tether (38), the slot (44) being sized in relationship to tether (38) to permit said tether guide (34') to grip the tether (38) in the slot (44), while allowing removal of the tether (38) from the slot (44) in response to pulling on the tether (38).

58. A control bar as claimed in claim 57, further characterized by the slot (44) terminating within said tether guide (34') in a circular portion (76).

59. A control bar as claimed in claim 57, further characterized by the circular portion (76) having a diameter greater than the width of the slot (44).